Natural Gas Vehicle Role in Fuel Diversity for California

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California **Natural Gas Vehicle** Coalition

Process to Achieve Goals

- Codify goals in state law
  - Petroleum reduction **and alt fuel penetration**
- Recognize what fuels / approaches can get you what gains
- Develop long term state policies
- Provide adequate incentives for market transformation

Goals

Underestimating

- CEC may be grossly understating the problem given the expected long and political protracted battle to increase CAFE
  - Without substantial / timely changes in CAFÉ California will face scenario of increase dependence on petroleum
- What is happening on world stage to petroleum consumption may make California efforts fall short of preventing economic disruptions
  - Increased petroleum use in developing nations will place constant upward competitive price pressure on petroleum regardless of what California does
  - **Alternative fuel penetrations greater than projected may be needed**

How

Fuels and Vehicles

- Fuels
  - CNG and LNG
  - Propane
  - Hydrogen
  - Others (blends and neat fuels)
- Vehicles
  - High efficiency vehicles

Blend Fuel Issues

- **Blend fuels don't change the market power equation for oil companies**
- **Continue dependence on gasoline and diesel**
- Vertically integrated oil companies have to deal with another entity for blend stock supply (ethanol producers, GTL producers)
- Increasing blend ratios has same impact as reducing oil company revenue if blend stocks have to be purchased from other entities
- Potential of economic/supply disruptions of blend stocks (e.g. corn for ethanol, natural gas for GTL plants overseas)
- Economic viability of blend stock industries

Blend Fuel Issues (cont.)

- CARB, OEMs, and petroleum companies agreement on formulation standards to guarantee emissions and performance
- OEMs have to design vehicles to accommodate fuel(s)
- Distribution channel contamination
- California or national fuels
- California or 50 state vehicle production
- How many blend fuels can be sustained

High Efficiency Vehicle Issues

- Political obstacles of achieving higher CAFÉ
- Reduced revenue for petroleum companies based on lower consumption per vehicle
- Lower tax revenues for the state based on lower consumption per vehicle
- High investment costs for OEMs

Natural Gas

Proven Markets for NGVs

- HD
  - Transit
  - School buses
  - Refuse
  - HD Trucks
  - Street Sweepers
- LD Vehicles
  - Compact cars, Pickups, Vans
- Essentially no vehicle product where natural gas couldn't be used

California Market Penetration

- 30,000 total NGVs
- 5,000 HD vehicles
  - Transit, Refuse, Trucks, and School buses
- 25,000 LD vehicles
- Displacing 70-75 million gallons / yr of petroleum (CNG and LNG)

Limited NGV Products

- Variable / changing policies create great risk for manufacturers
- Uncertainty in public policy creates reluctance for manufacturers to expand product lines
- Unified, long-term policies will expand vehicle / engine offerings
- Foreign examples

California Infrastructure

- 300 natural gas stations in California
- 50% stations public access
- 3% of stations for petroleum fueling
- No stations are joint venture stations with petroleum companies

Natural Gas Infrastructure

- **California business model allows expansion of market without oil companies**
- Notion of needing 10,000 fuel stations in Calif. to serve NGV market is incorrect
- Diesel market for hundreds of thousands of HD trucks supplied with network of 1,000 stations
- Home fueling will open market to consumer vehicles
- South American NGV market
  - Brazil – 850,000 vehicles - 900 stations
  - Argentina – 1.2 million vehicles - 1,200 stations

Natural Gas Supply Issues

- Expanding need for natural gas
  - Power generation
  - Residential, commercial, and industrial markets
- Need for natural gas based on fact that it is the most environmentally friendly fossil fuel (EPA)
- How can you promote NGVs in addition to other demands for natural gas??

NGVs in Perspective

- Demand growth for natural gas in other markets will far exceed growth of natural gas as a transportation fuel
- Solving California's need for natural gas will solve supply issues for NGVs (LNG import terminals, pipelines, renewables)
- 1 billion gallons of petroleum displaced by natural gas would equal 5% of California's natural gas use today
- NGV current market represents 0.375% of California's natural gas consumption

NGVs Can Deliver

- Focus on high fuel use fleet applications
- Infrastructure capable of building a consumer market
- 30,000 HD vehicles in high fuel use fleet applications can displace 400 million gallons of diesel fuel 2020
- 100,000 HD vehicles will displace 1 billion gallons of diesel by 2030
- 500,000 to 1 million LD NGVs displace 500 million gallons of gasoline by 2030
- 8-10% of todays petroleum use by 2030

Policies

Changing California Policies

Emissions and environmental policy drivers

TO

Energy security, petroleum displacement, greenhouse gases policy drivers

NGV Development Spurred by Federal and State Policies

- EPACT ('92) – Energy Security
- CEC Energy Diversity Programs
  - Methanol Transit Bus Program
  - Safe - Clean School Bus Program
  - Flex-fuel Program for LD Vehicles
- CPUC LEV Programs
- ARB Programs
  - LEV Program
  - ZEV Program
  - Carl Moyer Program
- SCAQMD Fleet Rules

Look Familiar?

- EPACT ('92)
  - Energy security / diversity
  - Petroleum displacement
    - 10% by 2000
    - 30% by 2010
  - Flawed design (LD focus)
  - Monitoring but no enforcement
- AB2076 goals
- Question: 12 years from now, will California have an energy policy as ineffective as EPACT???

EPACT Impact on California

- Purchase of bi-fuel / flex fuel that have never displaced petroleum
- Mindset was how to comply but not how to achieve objectives
- California policies support emissions reductions but not petroleum displacement

"California Energy Policy Act"

- Focus on petroleum displacement
- Parallel focus on greenhouse gases
- For heavy-duty as well as light duty vehicles
- On-road and off-road
- Incentives to encourage market transformation

California State Vehicles

- Ref. 2001 / 2002 State purchases
- 24% vehicles purchased subject to EPACT
- 19% vehicles purchased alt fuels
- 65% vehicles purchased had alt fuel option
- 0% vehicles ended up using alt fuels

Incentives

Incentives

- Moyer program for emissions reductions funded at $130+ million per year
- In 5 years – environmental advantage for natural gas over diesel may disappear
- “Moyer” type program needed to incent alternative fuels
- Greatest incentives for 100% dedicated non-petroleum fuels (e.g. NG, H2, propane, etc.)

Recommendations

- Codify ALL AB2076 goals in state law
  - Petroleum reduction
  - Alt Fuel penetration
- Decide who at state level would administer an alt fuels policy
- Develop long range policies for California
- Develop incentives for market transformation (e.g. “Moyer” type program for non-petroleum)
- State supported R&D for new generations of products / technologies